

September 2006

Status of Science Advisory Board Review of Ecology's Proposal to Establish a Site-Specific Fish¹ Consumption² Rate for the Asian Pacific Islander (API) Community Consuming Fish from Elliot Bay and the Duwamish River

Background

The Model Toxics Control Act (MTCA) Cleanup Regulation includes methods for establishing surface water cleanup levels that are based on preventing health risks associated with the consumption of contaminated fish and shellfish. The default parameters used in calculating surface water cleanup levels (e.g. fish consumption rates, fish diet fraction, etc.) are based on a recreational angler exposure scenario. However, the rule provides the flexibility to establish more stringent surface water cleanup levels when Ecology determines that such levels are "...necessary to protect other beneficial uses or otherwise protect human health and the environment..." (WAC 173-340-730(1)(e)). This provision was included because Ecology recognized that there may be situations where it is appropriate to use a higher site-specific fish consumption rate in order to protect populations that are at greater risk than the general population.

Ecology and EPA are currently overseeing cleanup actions at a number of sites located in the Elliott Bay and Duwamish River area. A primary concern at many of these sites is the potential for human exposure resulting from the release of contaminants into surface water and/or sediments and the accumulation of contaminants in fish and shellfish.

A large Asian Pacific Islander (API) community resides in the vicinity of the Duwamish River and consumes seafood that has been harvested from Elliott Bay and the Duwamish River. Several studies have shown that API communities consume larger amounts of fish and shellfish than the general population. Sechena et al. (1999) surveyed the fish consumption rates for ten API groups in King County and reported that these groups consume fish at rates substantially greater than the rates observed for recreational anglers or the general population.

EPA and Ecology conducted an extensive review and analysis of the Sechena et al. study. Based on that analysis, Ecology decided it was appropriate to use a site-specific fish consumption rate to protect the Asian-Pacific Islander community that consumes fish from Elliot Bay and the Duwamish River.

To protect the API population who may eat fish harvested from the Duwamish River and Elliott Bay, the MTCA surface water cleanup level equation for sites that contribute contaminants to these water bodies should be modified as follows:

- 1. Replace the MTCA fish consumption rate of 54 g/day and fish diet fraction of 0.5 (effective consumption rate of 27 g/day) with an effective fish consumption rate of 57 g/day (derived using the fraction of fish harvested from King County by APIs) and a fish diet fraction of 1.0.*
- 2. Use an average body weight for the API population of 63 kg, derived from the Sechena, et al., 1999, study.*

¹ Fish and seafood refer to all types of fish and shellfish, including marine and freshwater species.

² Consumption and ingestion will be used interchangeably.

Science Advisory Board Response to Ecology Questions

Ecology and EPA presented information on the technical evaluations and recommended values to the Science Advisory Board at the November 18, 2005 Board meeting. This issue and the Board's responses to a series of questions posed by Ecology were discussed at the December 15, 2005 Board meeting. The Board's responses to Ecology's questions are summarized below.

1. Does the Sechena et al., 1999 study provide a valid basis for estimating fish consumption rates for API populations in King County?

Dr. Faustman noted that the Sechena, et al., study is considered the "gold" standard for fish consumption studies. It is used as a basis for evaluation of other studies.

The SAB concurred that the Sechena, et al., 1999 study provides a reasonable scientific basis for estimating Duwamish River and Elliott Bay fish consumption rates for API populations.

2. How was use of cooked tissue weights associated with models addressed in utilizing the study results to derive an API uncooked seafood consumption rate?

The Board explored how the 25% and 50% weight correction factors were used when developing the final recommendation of 57 g/day. Lon Kissinger (EPA) explained that the 57g/day represented an averaging of the upper 95th percentile of the two calculations.

The SAB concurred that cooked tissue model weights have been appropriately considered in utilizing the Sechena, et al., 1999 study results to derive an API fish consumption rate.

3. Is pooling of the data from all ethnic groups surveyed appropriate and adequately protective of the different ethnic groups?

The SAB concurred that pooling fish consumption data from the 10 ethnic groups surveyed and weighing them based on King County census data is appropriate to develop a fish consumption rate reflective of the overall API population.

4. Does the SAB concur that the following recommendations are within the range of scientifically defensible values?

The SAB conceptually concurred with the Ecology recommendations at the December 15, 2005 meeting. Ecology worked with the Board to prepare a draft statement regarding the recommendations:

When developing Surface Water Cleanup Levels under MTCA for sites discharging surface water or ground water to the Duwamish River or Elliott Bay, for protection of Asian Pacific Islander Americans that consume fish from these waters, the Science Advisory Board concurs with the following Ecology recommendations:*

1. *The MTCA default fish consumption rate (54 grams/day) should be replaced by 57 grams/day.*
2. *The MTCA default Fish Diet Fraction (0.5) should be replaced by 1.0; and,*
3. *The Average Body Weight value of 70 kg should be replaced by 63 kg.*

The 57 g/d value (and fish diet fraction of 1.0) corresponds to the 95th percentile locally-harvested seafood consumption rate for 1st and 2nd generation Asian Pacific Islanders derived from the Sechena, et. al. 1999 study. 63 kg is the average body weight of the Asian Pacific Islanders surveyed in this study who consumed locally harvested seafood.

Broader Issues Raised During Science Advisory Board Discussions

The Board was asked to review Ecology's recommendations for a site-specific fish consumption rate for the API population in King County. In reviewing those recommendations, the Board identified several broader issues and concerns. These include:

- These values may not protect tribal fishers that consume fish from these waters. Ecology should move expeditiously to address these consumers.
- These values should not be applied to other State waters without a deliberative process examining the appropriateness of applying these values to other waters.
- The SAB encourages Ecology to develop a decision-making process for consideration of other more highly exposed fish consumers at other locations in Washington State.

The Board identified several questions that Ecology should consider when deciding when and how to modify the default parameters used to establish surface water cleanup levels. These include:

- How will Ecology take into account the size and characteristics of population groups when deciding whether to develop a site-specific fish consumption rate?
- What are the minimum data requirements for establishing a site-specific fish consumption rate?
- How will Ecology define the areas to apply site-specific cleanup levels? Is there a minimum size of the geographic area (e.g., county, river basin, etc.) to which site-specific cleanup levels would apply?
- How will Ecology decide when to conduct further investigation on fish consumption rates in response to citizen requests for revisions to cleanup levels?

Next Steps

- Ecology intends to use the recommended site-specific values when establishing cleanup levels/cleanup requirements for sites located in the Elliot Bay and Duwamish River area. However, many of these areas fall within the Usual and Accustomed Fishing areas for the Suquamish and Muckleshoot Tribes. Fish consumption rates for these population groups may be higher than values for the API community. Consequently, it is not clear whether the use of these values will significantly alter cleanup actions.
- Ecology will periodically review the recommended values taking into account the evolving body of scientific information on fish consumption rates.
- Ecology plans to begin the five-year review of the MTCA cleanup standards in late 2006. During that process, the Toxic Cleanup Program will consider the broader issues identified by the Board when reviewing whether and how to modify MTCA rule language on fish consumption rates.